REMARKS

The Office Action notes that claims 1-12 are pending in the referenced application and that claims 1, 4-6, 9, and 10 are rejected. In view of the following discussion, the Applicants submit that none of the claims now pending in the application is anticipated under the provisions of 35 U.S.C. § 102 or obvious under the provisions of 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

I. OBJECTION TO THE DRAWINGS

The Examiner objected to the drawings under 37 CFR 1.83(a). Specifically, the Examiner suggested that Applicants label element 204 of FIG. 2. By this response, the Applicants submit replacement drawing sheets in accordance with the Examiner's suggestion. The Applicants respectfully request withdrawal of the objection to the drawings.

II. REJECTION OF CLAIM 1 UNDER 35 U.S.C. § 102

The Examiner rejected claim 1 under 35 U.S.C. §102(e) as being anticipated by Werner et al. (U.S. Patent No. 6,493,381 issued December 10, 2002) (Werner). The Applicants respectfully disagree.

Werner discloses "a receiver, comprising an adaptive filter that performs blind equalization using a modified form of the constant modulus algorithm (CMA). This modified form of CMA is referred to as symbol CMA (SCMA). SCMA utilizes both the constant R and the sliced symbols, $\hat{A}_n$, in performing blind equalization. The constant R is statistically [related] to the sliced symbols, $\hat{A}_n$. The adaptive filter is a two-filter structure. The SCMA blind equalization technique reduces the rate of occurrence of a diagonal solution." (Werner, Abstract) The SCMA is not a true two dimensional solution. At col. 5, lines 50-55, Werner admits that SCMA is a pseudo-two dimensional solution that requires two cost functions.

The Examiner's attention is directed to the fact that Werner fails to teach, disclose, or suggest "minimizing said cost function using a gradient recursion algorithm", as recited in claim 1. Specifically, Applicants' claim 1 positively recites:

> 1.   A method of equalizing a radio frequency (RF) signal comprising:
>   generating a cost function using amplitude and phase components of the output signal of an equalizer;
>   minimizing said cost function using a gradient recursion algorithm; and
>   adjusting the tap weights of said equalizer using the result of said gradient recursion algorithm. (emphasis added)

Applicants' invention is directed to a method and apparatus for equalizing a radio frequency (RF) signal using a modified constant modulus algorithm (M-CMA). In one embodiment, the M-CMA performs blind equalization by updating the tap weights of an equalizer via a cost function that is derived using both the amplitude and the phase of the output signal. The cost function is minimized using a gradient recursive algorithm and the tap weights are adjusted accordingly. Use of both the amplitude and phase information results in quicker convergence and faster tracking of dynamic distortions in the input channel. The M-CMA operates independently of spacing and modulation scheme of the input signal.

Werner neither teaches nor discloses minimizing a cost function using a gradient recursion algorithm that combines amplitude and phase components into the cost function (i.e., a true two dimensional solution). At best, Werner discloses the use of a blind equalization algorithm, however, Werner is completely devoid of any teaching or suggestion of the minimization of a cost function using a gradient recursion algorithm or using amplitude and phase components in the cost function.

Therefore, the Applicants submit that claim 1 as it now stands, fully satisfies the requirements of 35 U.S.C. §102 and is patentable thereunder. Withdrawal of the rejection is respectfully requested.

III.   REJECTION OF CLAIMS 4-6, 9, AND 10

Claims 4-6, 9, and 10 stand rejected under 35 U.S.C. § 103(a) as being obvious over Malkemes et al. (US 2002/0206040 A1) (Malkemes) in view of Werner. Applicants respectfully traverse the rejection.

Regarding claims 4-6, 9, and 10, Applicants respectfully submit that Malkemes was improperly cited by the Examiner. Under 35 U.S.C. § 103(c),

> "[s]ubject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

In this instance, both the claimed invention and the Malkemes Publication have the same assignee. The present invention and the Malkemes Publication are both assigned to Sarnoff Corporation. The recordation date of the present invention (09/828,324) is April 6, 2001. The Reel/Frame number of the present invention is 011708/0819. The recordation date of the Malkemes publication (09/776,078) is February 2, 2001. The Reel/Frame number of the Malkemes publication is 011553/0721. Thus, the Examiner has failed to present a prima facie case of obviousness in combining Malkemes with Werner to arrive at the claimed invention of Applicants' claims 4-6, 9, and 10. Therefore, the Applicants submit that claims 4-6, 9, and 10 as they now stand, fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Withdrawal of the rejection is respectfully requested.

IV.   ALLOWABLE SUBJECT MATTER

Claims 2, 3, 7, 8, 11 and 12 were objected to by the Examiner as being dependent upon a rejected base claim. Applicants thank the Examiner for indicating the conditional allowability of such subject matter, but have hereinabove provided arguments refuting the rejections of the independent claims. Thus, no changes to the dependent claims are made at this time. Withdrawal of the objection is respectfully requested.
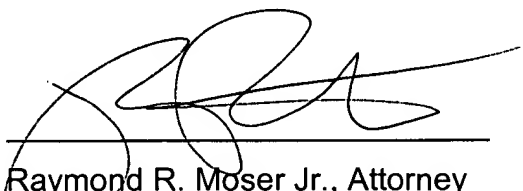
316708_1

CONCLUSION

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone <u>Mr. Thomas Bethea, Jr., Esq.</u> at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

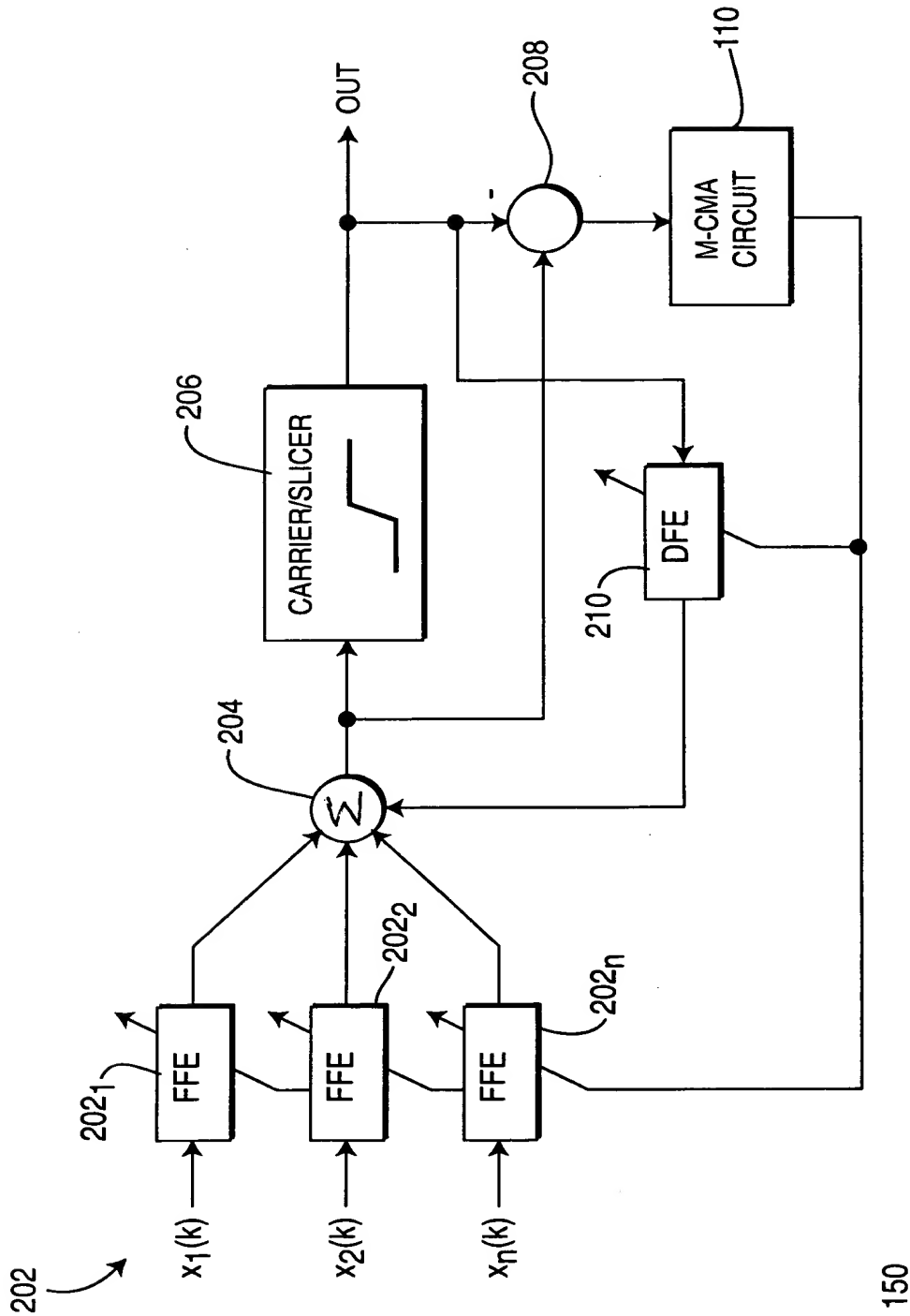Respectfully submitted,

11-11-04
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Date

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AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include changes to FIG. 2. An Annotated Drawing Sheet (with changes marked in red) and a Replacement drawing sheet is provided with this response.

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METHOD AND APPARATUS FOR
EQUALIZING A RADIO FREQUENCY
SIGNAL
Serial No. 09/828,324
Atty. Docket No. SAR/14209
ANNOTATED SHEET

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FIG. 2